

Catrina Reid - Online Learning Experience (OLE) Planning Grid - ITEC 7480 & 7481

Curriculum Standard (applicable to k12 only): 5th Grade Mathematics {Numbers and Operations}

- I. Write and interpret numerical expressions
 - MCC5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
 - MCC5.OA.2 Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
- II. Understand the Place Value System
 - MCC5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
 - MCC5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- III. Perform operations with multi-digit whole numbers and with decimals to hundredths
 - MCC5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm
 - MCC5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models

Student Objectives/Outcomes:	Bloom's Level:	Activities:	Assessments:
1. Write and solve expressions including parentheses and brackets	Application	<ul style="list-style-type: none"> • Complete order of operations worksheet. • Students analyze a mock work sample to demonstrate and explain their understanding of the order of operations. 	<ul style="list-style-type: none"> • Online quiz.
2. Interpret numerical expressions without evaluating them.	Synthesis	<ul style="list-style-type: none"> • Students work to write expressions and solve equations. • Students will determine how many windows and doors can be painted to earn \$40. • All solutions should be recorded on Money for Chores recording sheet. 	<ul style="list-style-type: none"> • Completion of the assignment and gaining full credit.
3. Apply the rules for order of operations to solve problems.	Evaluation	<ul style="list-style-type: none"> • You and your best friend, Sasha, sat down after school at your house to work on your math homework. You both agreed to work out the problems and check each other's 	<ul style="list-style-type: none"> • Peer assessments.

		work for mistakes. Here is Sasha's homework paper. She didn't show her work, but she did list her answers to each problem. Check her work for her and explain to her how you know her answers are correct or incorrect.	
4. Solve word problems involving the multiplication of 3- or 4-digit multiplicand by a 2- or 3-digit multiplier.	Comprehension	<ul style="list-style-type: none"> Students will practice and apply multiplying a one-digit number by up to a four digit number. Students will use multiplication to determine the amount of supplies to ship to a patient's home to treat an illness. Using this information, students will need to complete an invoice reflecting just enough medication for the patient's duration of treatment. 	<ul style="list-style-type: none"> Essay questions.
5. Use exponents to represent powers of ten.	Evaluation	<ul style="list-style-type: none"> Students are asked to identify, describe, and explain any patterns they notice when multiplying numbers by powers of 10 such as 1,000, 100 and 10. 	<ul style="list-style-type: none"> Successful completion of this assignment.
6. Solve problems involving the division of 3- or 4- digit dividends by 2-digit divisors.	Comprehension	<ul style="list-style-type: none"> Students will analyze story problems that demonstrate three different division situations. 	<ul style="list-style-type: none"> Essay questions

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Curriculum Standard (applicable to k12 only): 5th Grade Mathematics {Decimals}

I. Understand the Place Value System

- MCC.5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- MCC.5.NBT.3 Read, write, and compare decimals to thousandths.
 - Compare two decimals to thousandths based on meanings of the digits in place using $>$, $=$, and $<$ symbols to record the results of comparisons.
- MCC.5.NBT.4 Use place value understanding to round decimals to any place.

II. Perform operations with multi-digit whole numbers and with decimals to hundredths.

- MCC.5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Student Objectives/Outcomes:	Bloom's Level:	Activities:	Assessments:
1. Understand place value relationships to the thousandths	Knowledge	<ul style="list-style-type: none"> • Play a game using the dice on the Active Inspire software, using place value charts to create the largest possible number by rolling a die and recording digits on the chart one at a time. • Construct designs using 10-frames and on a hundredths grid and identify the shaded and un-shaded parts of the grid as fractions and decimals 	<ul style="list-style-type: none"> • Teacher's feedback on the chart • Essay questions
2. Compare decimals and express their relationship using the symbols, $>$, $<$, or $=$	Comprehension	<ul style="list-style-type: none"> • Construct a bar graph showing the batting averages of Atlanta Braves baseball players and answer questions about the data. They will order, compare, and round the decimals in the problem. 	<ul style="list-style-type: none"> • Completion of the bar graph.

3. Order, add, and subtract one, two, and three digit decimals	Knowledge	<ul style="list-style-type: none"> Students learn a game that allows them to practice adding and comparing decimal numbers. The focus of this game is on adding decimal numbers to the hundredths place. Students play a game that allows them to practice subtracting and comparing decimal numbers. 	<ul style="list-style-type: none"> Peer assessments
4. Place decimals on a number line. Represent decimal addition and subtraction on a number line.	Application	<ul style="list-style-type: none"> Place decimal numbers (tenths and hundredths) on a number line and order them. Students will participate in a game using mental strategies to add decimal numbers. 	<ul style="list-style-type: none"> A number line in which students have to place decimals on the line correctly.
5. Use decimals to solve problems	Application	<ul style="list-style-type: none"> Students complete a task that requires them to think about patterns of numbers in addition of decimals. There is more than one correct answer which may lead them to the realization of multiple combinations of numbers can result in the same sum. 	<ul style="list-style-type: none"> Online quiz

Online Learning Experience (OLE) Planning Grid - ITEC 7480 & 7481

Curriculum Standard (applicable to k12 only): 5th Grade Mathematics {Multiplying and Dividing Decimals}

- I. Understand the place value system
 - MCC5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- II. Perform operations with multi-digit whole numbers and with decimals to the hundredths.
 - MCC5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Student Objectives/Outcomes:	Bloom's Level:	Activities:	Assessments:
1. Understand place value	Comprehension	<ul style="list-style-type: none"> Students explore the pattern of powers of 10 with base ten blocks. 	<ul style="list-style-type: none"> Discussions
2. Use whole number exponents to denote powers of 10	Application	<ul style="list-style-type: none"> Students are asked to identify, describe, and explain any patterns they notice when multiplying or dividing numbers by 1000, 100, 10, 0.1, and 0.01. 	<ul style="list-style-type: none"> Teacher's evaluations and feedback
3. Model multiplication and division of decimals	Application	<ul style="list-style-type: none"> Students will create rectangular arrays as a representation of multiplication and division of decimals. 	Formative Assessment Questions <ul style="list-style-type: none"> If the flat is 1 unit, what does a long represent? What does a unit block represent? How many groups do you need to represent? How many do you have in all? How can you create any array using multiplication? Where are the factors located? Where is the product? Can you identify the partial products? What properties of multiplication are you using? How can you create an array using the dividend? How do you represent the divisor in the array? Where is the quotient

			represented?
4. Multiply and divide decimals with fluency	Application	<ul style="list-style-type: none"> Students will find all possibilities for missing numbers in a decimal multiplication number sentence. 	<ul style="list-style-type: none"> Successful completion of the assignment
5. Recognize student errors in multiplication and division of decimals	Knowledge	<ul style="list-style-type: none"> Students will use division or other basic operations to find the number of coins equal to a given dollar value. 	<ul style="list-style-type: none"> Successful completion of the assignment

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Curriculum Standard (applicable to k12 only): 5th Grade Mathematics {Adding, Subtracting, Multiplying, and Dividing Fractions}

- I. Use equivalent fractions as a strategy to add and subtract fractions.
 - MCC5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
 - MCC5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- II. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
 - MCC5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- III. Represent and Interpret data.
 - MCC5.NF.3 Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Student Objectives/Outcomes:	Bloom's Level:	Activities:	Assessments:
1. Introduce real life problem while reinforcing the concepts of fractions.	Application	<ul style="list-style-type: none"> • Some fifth grade classes are making cookies to demonstrate their understanding of fractions. Some classes will make sugar cookies and the other classes will make oatmeal cookies. They need to adjust the recipes to make larger or smaller quantities. They need your help with determining the quantities of ingredients needed. 	<ul style="list-style-type: none"> • Evaluation of the adjustments.
2. Use reasoning to solve fraction division word problems.	Evaluation	<ul style="list-style-type: none"> • Use your reasoning skills to solve the following fraction division problems. • Use manipulatives of your choice to investigate and determine the quotient. • Create a representation to show your results. Grid paper may be used if you find that helpful. • Compare the quotient to the dividend and divisor. Explain whether the 	<ul style="list-style-type: none"> • Creation of the representation.

		quotient is larger or smaller and why.	
3. Use fractional understandings and build fractional computation strategies.	Application	<ul style="list-style-type: none"> Play an interactive board game where players race bikes on a game board by adding fractions with like denominators. http://www.counton.org/games/map-fractions/racing/ 	<ul style="list-style-type: none"> Self-assessment
4. Develop strategies to find equivalent fractions.	Application	<ul style="list-style-type: none"> Group activity: Students will be designing a hiking trail for a four day Hike-a-thon. The trail is 6.0 km and is in the GA Mountains. The committee has decided what kind of informational markers and stations are needed and how often they should be placed. Your task is to figure out where to put informational markers and stations along the way. Students must draw a map of the hiking trail, and make it to scale. (1 kilometer = 10 inches on the map scale) 	<ul style="list-style-type: none"> Peer evaluations

Curriculum Standard (applicable to k12 only): 5th Grade Mathematics {Volume and Measurement}

- a. Convert like measurement units within a given measurement system
 - MCC5.MD.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi- step, real world problems.
 - MCC5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
- b. Understand concepts of volume and relate volume to multiplication and to addition.
 - MCC5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
 - MCC5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.
- c. Represent and Interpret Data
 - MCC5. MD.2 Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.

Student Objectives/Outcomes:	Bloom's Level:	Activities:	Assessments:
1. Identify faces, edges, and vertices of cubes and rectangular prisms.	Analyze	<ul style="list-style-type: none"> Students will complete a worksheet identifying the faces, edges, and vertices of cubes and rectangular prisms. 	<ul style="list-style-type: none"> Worksheet
2. Understand volume can be determined by finding the product of the area of the base times the height $V = B \times h$. or $V = l \times w \times h$	Knowledge	<ul style="list-style-type: none"> Students will use various forms of technology to create a display of square and cubic units in order to compare/contrast the measures of area and volume. 	Formative Assessment Questions <ul style="list-style-type: none"> How are area and volume alike? How are area and volume different? Why is area labeled with square units? Why is volume labeled with cubic units? Think about your home – bedroom, kitchen, bathroom, living room. What would you measure in square units? Why? What would you measure in cubic units? Why?
3. Estimate and determine the volume of cubes and rectangular prisms. 4. Compare the volume of	Evaluation Comprehension	<ul style="list-style-type: none"> For each object, students will estimate the number of centimeter cubes that will be needed completely fill the box. (They should NOT fill the box with centimeter cubes to estimate.) 	<ul style="list-style-type: none"> Peer assessments

different objects with and without formulae.		<ul style="list-style-type: none"> • After all estimates have been recorded, students will use their measurement tools to determine the volume of each box. All measurements should be to the nearest tenth of a centimeter. • After students have found the volume of each box, compare results. • Discuss any discrepancies. • Discuss with other students your strategies for making their estimate and determining the volume. 	
5. Convert volume measurements within a single system of measurement (customary, metric).	Synthesis	<ul style="list-style-type: none"> • Students will be designing three different sizes of cereal boxes. • They will need to determine the dimensions for the original box and then use the appropriate operations to enlarge or reduce the size of the original box to meet the specifications of the manufacturer. • Students will use an interactive Illumination to help explore the volume of a box based on the amount of the unit cubes that can fit inside of it. http://illuminations.nctm.org/ActivityDetail.aspx?id=6 	<p>Formative Assessment Questions</p> <ul style="list-style-type: none"> • Justify why you chose which unit of measure to use. • Is your answer reasonable? How do you know?
6. Measure solid cubes and rectangular prisms using standard customary and metric measures	Synthesis	<ul style="list-style-type: none"> • Students will draw and label rectangular prisms and roll a die to determine the measurements to calculate its volume. 	<ul style="list-style-type: none"> • Teacher's evaluation of the activity